GLOBE NOTES

Per R. H.

1666.

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H.J

Catherine Davies.

The Gift of my Brother Davies.

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GLOBE
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NOTES UPON Both Globes

Celeſtiall and Terreſtiall.

Firſt concerning the Celeſtiall GLOBE.

It is the modell of Heaven, but chiefely of the eight ſphere, wherein three things are to be obſerved in generall.

viz.

1. Definition.
2. Delineations.
3. Uſe.

1. *The Definition.*

It is a ſphericall body, having a poynt or center in the middeſt, from whence right

lines being extended to the ſuperficies they are all equall.

2. Delineations.

Which are theſe three,

1. *The Lines or Cyrcles.*
2. *The principall points.*
3. *The Figures or Conſtellations.*

1. FIrſt of the Lines or Circles, every of which are actually or intellectually divided into 360 equall parts called Degrees, the more principle whereof are theſe tenn, which make up the *Sphæra armillaris*, ſix whereof are great circles, as be all thoſe which divide the Globe into two equall parts, or hemiſpheres, having the ſame center with the Globe; And the other foure are called ſmaller cyrcles, becauſe they divide the Globe into two unequall parts or ſegments.

The 6 great cyrcles are theſe.

1. The Horizon is that broad cyrcle upon the frame, this divideth the Globe into two hemiſpheres, the one which we ſee, is allwaies above the horizon, the other which we ſee not is below: And on the horizon are drawn divers

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divers cyrcles, *viz.* of the 12 Signes, and of the dayes of the Months, and the 32 winds.

2. The Meridian is the brasse cyrcle which standeth at right angles to the Horizon, and in which the Globe is hanged and turned about on its poles, which are the ends or extremity of the axis of the World, and upon the Meridian, is another little howre cyrcle fastened, with an index moving about upon the Pole.

3. The Equinoctiall is drawn upon the superficies of the Globe, in the middest between the two Poles of the World, and the degrees thereof are numbred with 10, 20, 30, &c. to 360.

4. The Ecliptick line, this cutteth the Equinoctiall in two poynts, and is divided into 12 Signes, each containing 30 degrees, and it passeth in the middest of the Zodiac, for the Zodiac is a broad cyrcle containing 16 degrees in breadth, and is the bounder of the 7 Planets.

5. The Equinoctiall Colure, this cutteth the Equinoctiall at right angles, in the two poynts where the Ecliptick passeth over the same Equinoctiall line, and so passeth through the Poles of the World.

6. The Solstitiall Colure, this passeth through the Ecliptick where it toucheth both the Tropicks, and cutteth both the Equinoctial and Ecliptick at right Angles, and passeth

through the Poles of the World, where also it cutteth the Equinoctial Colour at right Angles.

The 4 lesser Cyrcles are,

1. The two Tropicks, each being parallel to the Equinoctial, and about 23 degrees, and 31 from it. That which is toward the *North* Pole, is called the Tropick of Cancer; That which is toward the *South* Pole, is called the Tropick of Capricorne, and these are the bounders of the greatest Declination of the Sun.

2. The two Polar Cyrcles, these are so far distant from the Poles of the World, as the Tropicks are from the Equinoctial; That which is next the *North* Pole, is called the Artick Polar Cyrcle, and that which is next the *South* Pole, is called the Antartick Polar cyrcle.

There are moreover drawn upon this Globe divers other great Cyrcles passing by the beginning of the twelve Signes, cutting each other in two opposite points, and these with the Solstitial Colour, divide the Globe into 12 equal parts, and these are called the Cyrcles of the Longitude of Stars.

Also through every point of the Meridian, there are small Cyrcles imagined to be drawn parallel to the Equinoctial, which are called the

the parallels of Declination of the Sunne and Stars.

Alſo the like ſmall Cyrcles are imagined to be drawn parallel to the Horizon, and theſe are called Almicantars, or Cyrcles of Altitude.

The ſecond thing noted in the Delineation, is the Points to be obſerved on the Globe.

1. THe more principal are theſe, *viz.* The two Points on which the Globe is hanged and turned about within the Brazen Meridian, theſe repreſent the Poles of the World, from one of which to the other, there paſſeth a ſtreight line through the Center of the Globe called the Axis of the World: where Note, that the two Poles of the World are the common Sections of all the Meridian Cyrcles.

2. The two Poles of the Ecliptick, which are the two points in which the ſix Cyrcles of Longitude of Stars do croſs or cut each other, and is near about 23 degrees 30 minutes diſtant from the Poles of the World.

3. The points of Zenith and Nadir, the Zenith is that Point in the Heavens which is directly over our Head, and the Nadir, is on the contrary, directly under our Feet, theſe two are the Poles of the Horizon, being every

where 90 degrees from it, and in these two points do all the Vertical or Azimuthal cyrcles meet or cut each other.

4. The points of *East* and *West*, *viz.* The two points where the Equinoctial cutteth the Horizon; these are also Diametrically opposite, and are the Poles of the Meridian being every where 90 degrees from it.

5. The two Equinoctial points of Aries and Libra, being two points where the Ecliptick cutteth the Equinoctial, and are Diametrically opposite, the former is called the vernal Equinoctial because the Sun coming to it, the spring beginneth; the other is called the Autumnal Equinoctial, because when the Sun cometh to it, the Autumn beginneth.

6. The two Solstitial points, being also diametrically opposite, are the two points on the Globe, where the Ecliptick toucheth the two Tropicks and the Ecliptick in their touch point, *viz.* in the beginning of Cancer and Capricorn, and these two are called Solstitial points, because the Sunne moving in the Ecliptick, near either of them, which is in *June* and *December*, it causeth the days to stand still a while, without a sensible lengthning or shortning.

Here is to be noted, that the Horizon and Meridian Cyrcles are said to be immoveable, because they are fixed to the same place; but all other cyrcles of the Sphear are said to be movable

movable, becauſe they being drawn upon the Surface of the Globe or Sphere, muſt needs move about with it in the Diurnal motion, yet other men denominate them by the contrary names.

The third thing obſerved in the Delineations, are the Figures drawn upon the Globe.

THere hath been 48 Aſteriſmes or Conſtellations obſerved of ancient time, and about them in this Globe are deſcribed certain Figures, not becauſe there are any ſuch Figures in the Heavens, but are only imagined there to give denomination to the Stars of the Firmament, and yet not to all the Stars, for they are innumerable, but onely to ſuch as are moſt conſpicuous, and whereof uſe may beſt be made, as occaſion ſerveth.

There are 12 Conſtellations of the Zodiack, through which the Zodiack paſſeth, and theſe give Denomination to the 12 Signes of the Zodiack, in particular theſe with their number of Stars.

	of old.	of late.		of old.	of late.
♈	13	21	♎	8	17
♉	33	43	♏	21	16
♊	18	25	♐	32	14
♋	9	15	♑	28	28
♌	27	40	♒	42	41
♍	26	39	♓	34	36

There hath been 21 Conſtellations obſerved on the *North* ſide of the Ecliptick, which are called the Northern Conſtellations, whoſe names and number of Stars here follow.

	of old.
The little Bear	7
The great Bear	27
The Dragon	31
Cepheus	11
Bootes	22
The Northen Crown	8
Hercules	09
The Vulture Cadent	10
The Swan	17
Caſſiopeia	13
Perſeus	26
Auriga	14
Serpentarius	24
The Serpent	18
The Arrow or Dart	5
The Eagle	9
The Dolphin	10
The leſſer Horſe	4
Pegaſus or great Horſe	20
Andromeda	23
The Northen Triangle.	4
Antinous.	8

There are 15 Conſtellations on the *South*-ſide of the Ecliptick, which are called the Southerne

thern Conſtellations, whoſe names and number of Stars here follow.

	of old.
The Whale	22
Orion	38
The River Eridanus	34
The Hare	12
The great Dog	18
The leſſer Dog	3
The Ship	45
Hydra	25
The Goblet	7
The Raven	7
The Centaur	37
The Wolf	19
The Altar	7
The Southern Crown	13
The South-fiſh.	12

Beſides the number of the Stars noted in the former Conſtellations, the modern Aſtronomers have noted divers others, which were left *informes* by the Ancients, and put them into their proper Figures; as may be ſeen in ſome of the Globes put forth ſince noble *Ticho Brach*, namely, *Johannes Janſonius*, his ſmall Globes of the Year 1620. And in *Petrus Plantius* his Globes of the Year 1625.

The

The new Conſtellations in North Latitude, are theſe,

Berenices hair	14
The Bee	4
The River Jordan	21
Camelopardalis	18
The River Euphrates	13

The new Conſtellations in South Latitude are theſe.

The leſſer Crabb	4
The Unicorne	22

Moreover becauſe the antient Aſtronomers lived all in North Latitude, they could not ſee the ſtarrs which are neer the South pole, but they have been ſince diſcovered by ſuch as have travailed that way, and are put into conſtellations, namely theſe,

The Dove	11
The Southern triangle	5
The *apous Indica*	12
The Peacock	17
The Indian	12
The Crane	13

The

The Towcan	8
The Hydrus	14
The Phenix	14
The Dorado	6
The Sea Swallow	7
The Camelion	8
The Crosse called *Crusero*	6
The Flye	4

Besides the Constellations before named, there are some other appearances in the heavens, namely, the White broad cyrcle called *Via Lactea*, or milkie way: and two little clouds observed neer the South pole. Thus much of the Delineations, or things noted on the outside of the Celestiall Globe.

The third thing to be observed in Generall is the use of this Globe,

Which consisteth in these three things following. *viz.* The knowledge of the

1. *Motions.*
2. *Division,*

And Operation of the

3. *Propositions.*

In

In the first place of the motions which are also three in number, *viz.*

1. The *Diurnall* motion.
2. The *Proper* motion.
3. The *Tremblimg* motion.

First concerning the Motions.

1. The *Diurnall* motion is made upon the Poles of the World, once about from East toward the West in 24 howres, and this is also called *motus raptus*, or the motion of the *primum mobile*.

2. The second motion is called the *annuall motion*, and is made within the *primum mobile* upon the Poles of the Ecliptick, according to the succession of the signes, which is contrary to that of the *primum mobile*, *viz.* from West toward East, and this motion is called *Motus secundus*, or *Motus proprius*, because that every Spheare hath a motion proper to it self, As that of the Sunne ☉ finisheth once about *secundum seriem signorum* in the space of 12 months, which is called the Solar yeare, Also *Venus*, ♀, and Mercurie ☿, are moved about the same way in the same time, But the Moon ☾ is moved about in one month, and the Month is of two sorts, for the time wherein the Moon ☾, departeth from any poynt of the Zodiack and re-

returneth to it againe, is called the periodicall Month, or month of peragration, But the time wherein the Moon departeth from the Sunne ☉, and overtaketh him againe is called the month of Consecution, or Synodicall month.

Mars ♂ moveth through the Zodiack in about two Solar years, and that time is called the yeare of Mars ♂.

Jupiter ♃ is moved through the Zodiack in about 12 Solar years, and that time is called the yeare of Jupiter ♃.

Saturne ♄ in about 30 years runneth through the Zodiack, and that time is called the yeare of Saturne ♄.

2. The fixed Starrs, according to *Ptolomie*

3. The third Motion is called *Motus trepidationis*, or the trembling or tottering Motion, made by the eighth Sphere of fixed Stars; and all other inferior Orbs, from North to South, and again from South toward North, and so back and forward by the space of 24. minutes of a degree. This is the cause of the alteration of the greatest declination of the Sun and other Planets. But concerning these internal Motions, more is to be found in reading of the Theoricks of the Planets.

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§. The fixed Starrs, according to *Ptolomie* move about the Zodiack in 36000 Solar years; But according to the *Alphonsines* in 49000 years; And according to *Copernicus* in 17000 years; But *Gassendus* hath it 25000 years; And this time is called the great yeare, or *Platonicall* yeare.

Secondly concerning the Divisions.

1. First it is called *Sphera recta*, or a right Sphere, because in such position, the Equinoctiall cutteth the Horizon at right spherical angles. The properties of this sphere is to have the poles of the world ly in the horizon, and the Equinoctiall passeth through the Zenith

nith and Nadir; and in this ſphere not only the Equinoctiall, but alſo both the Tropicks, and all other the Equinoctiall parallels, are divided into two equall parts by the right horizon, which cauſeth the dayes, and nights, at all times of the yeare to be equall, *viz.* 12 howres long between Sun riſing and ſetting without alteration, to thoſe who live under the Equinoctiall line.

2. Secondly it is called *Sphæra obliqua*, whereof there are ſo many in number as there be degrees, minutes, ſeconds, *&c.* in a quadrant, And it is called oblique, becauſe the Equinoctiall cutteth the horizon with an obliqse angle; The properties of this ſphere is to have one pole elevated above the horizon, and the other as far depreſſed; Alſo becauſe in this ſphere the Equinoctiall is divided equally by the horizon, and the parallels of the Equinoctiall unequally, therfore the days, and the nights are equall only twice a year, *viz.* in the begining of the Spring, & Autumne, at which times the Sunne paſſeth over the firſt points of Aries ♈ and Libra ♎, but at all other times of the year, the days and nights are unequall.

3. It is called *Sphera parallela* or a parallel Sphere, becauſe the Equinoctiall being the ſame with the Horizon, all the parallels of the Equinoctiall are olſo parallell to the Horizon; In this ſphere, one of the poles of the World is

the

the Zenith, and the other is the Nadir, and in this ſphere the Sun continueth above the Horizon above halfe a yeare together, and again as long under the Horizon, whereby the artificiall day and night are each about half a year long.

Thirdly, now follow the propoſitions wrought by the Globe.

1. To find the Suns place in the Ecliptick firſt find the day of the Month, upon the Horizon, and within upon the limb of the Horizon ſtandeth the degree in which the Sun is, this you may apply to the Ecliptick upon the Globe.

To find the Suns Declination.

2. Firſt find the Suns place in the Ecliptick upon the Globe, and bring it to the brazen Meridian, and there account how many degrees it is diſtant from the Equinoctiall, for the declination of any point in the heavens is its Meridionall diſtance from the Equator.

The declination of any ſtar upon the Globe, is found by bringing it to the brazen meridian and accounting as before.

To find the right aſcention of the Sunne.

3. Move the degree of the Ecliptick wherein the Sun is to the Meridian, and note the de-

gree of the Equinoctiall which cometh to the Meridian with it, for the arch of the Equinoctiall conteyned between that point and the first point of Aries ♈, is the right ascention, that is to say, it riseth with it in a right sphere.

The right ascention of a starr is to be accounted as before, if the starr be brought to the Meridian.

Of the Longitude as it is taken on the Celestiall Globe.

4. The Longitude of the Sun, is that arch of the Ecliptick which is contained between the first point of Aries, and that point of the Ecliptick wherein the Sun ☉, is; But the Longitude of a Star is that arch of the Ecliptick which is contained between the first point of Aries, and the section of the Ecliptick with a great circle drawn from the pole of the Ecliptick through the center of the starr, being reconed according to the succession of the signes.

Which to finde,

Lay one end of the Quadrant of altitude upon the pole of the Ecliptick, and the graduated edge thereof, upon the center of the starr, and so it shall shew in the Ecliptick, the signe and degree of Longitude.

Of the Latitude as it is taken on the Celestiall Globe.

5. It is accounted in a great cyrcle distance from

from the Ecliptick toward either Pole thereof, therefore the Sunn, or any ſtarr being in the Ecliptick, hath no Latitude, but the Moon ☾, or any other Planet being not in the Dragons Head ☊, or Dragons taile ☋, or other ſtars being not in the Ecliptick, are ſaid to have Latitude ſo many degrees as they be diſtant from the Ecliptick toward either pole thereof.

Which to finde,

Lay one end of the quadrant of altitude upon the pole of the Ecliptick, and the graduated edge thereof, upon the center of the ſtarr, then may you ſee how many degrees thereof are contained between the ſtarr and the Ecliptick, and that is the Latitude thereof.

But if you want the quadrant of Altitude then take a pair of compaſſes, and ſetting one point in the center of the ſtarr, extend the other till in the neereſt diſtance it touch the Ecliptick, and the compaſſes ſo opened and applied to the Equinoctiall, ſhall ſhew how many degrees the Latitude is.

Here note,

That the declination and right aſcention of the Sunn and Starrs, have reſpect to the Equinoctiall, but their Longitudes and Latitudes have reſpect to the Ecliptick.

To rectifie the Globe according to the Latitude of your place.

6. Elivate the proper pole ſo farr above the

 horizon

horizon as the Latitude of rhe place propoſed, by moving the pole of the Globe ſo high by help of the degrees of the meridian.

But to rectify for the Suns place is.

7. After the former rectification to bring the Suns place in the Ecliptick, to the meridian, turning up the index of the howre wheele to 12 at noon.

And to rectifie for the Zenith is,

8. After the firſt rectification, to faſten the nutt or ſcrew of the Quadrant of altitude at the Zenith, that is, ſo many degrees from the Equinoctiall as the Pole is elevated.

To find the Amplitude of the Sun or any ſtar that riſeth and ſetteth.

9. The Amplitude is the horizontall diſtance of riſing or ſetting from the true points of Eaſt and Weſt, which to find rectify the Globe by the ſixt Propoſition according to the Latitude, and bring the degree of the Sun in the Ecliptick, or Center of the Starr to the horizon, and therein ſee how many degrees it is from the Eaſt or Weſt.

To find what ſtarrs do not ſet in any Latitude.

10. By the ſixt Prop. rectify according to the Latitude, and turning about the Globe mark what ſtarrs paſſe between the elevated pole and the horizon, for thoſe (if the North pole be elevated) are contained within the arctick circle and cannot ſet ; for the arctick circle

circle as heretofore it hath been taken, is drawn upon the North pole, through the north point of the Horizon.

To find the time when the Sunn or any Starr riſeth or ſetteth.

11. By the ſeaventh Prop. rectifie for the Sunns place, and move the degree of the Sun or center of the Starr to the Eaſt or Weſt part of the horizon, and then the index of the hower wheel ſhall ſhew the time.

To find how the Conſtellations are ſcituate at any time of the Night.

12. By the ſeaventh Prop, rectifie, for the Suns place, and move about the Globe till the index come to the howre deſired, and there hold the Globe to ſhew the preſent ſcituation of the Conſtellations.

To find the Oblique aſcention of the Sunn or any Starr that riſeth and ſetteth.

13. By the ſixt Prop. rectifie for the Latitude, and bring the degree of the Sun, or center of the Star to the Eaſt part of the horizon, and obſerve the degree of the Equinoctiall which riſeth with it, for the arch of the Equinoctiall contained between the firſt point of Aries ♈, and the point of the Equinoctiall ſo aſcending is called the oblique aſcention.

To find the Aſcentionall difference of the Sun ☉.

14. By the third Prop. find the right aſcention, and again by the thirteenth prop. find

the oblique aſcention thereof, and ſubtract the leſſer of them from the greater, and the remain is the difference of aſcention: for the difference of aſcention, is only the difference between the right & oblique aſcentions: where note that the difference of aſcention is an arch of the Æquinoctiall, and is alwaies the time of the Sunns riſing before 6 and after 6, the time of the year being conſidered.

Hereby.

15. To get the time of the Sun's riſing to a minute of an howre; turn the aſcentionall difference into time, allowing 15 gr. thereof to every howre, and to every degree 4 minuts of an howre; And if the Sun be in the Northern ſignes the aſcentionall difference is the time of the Suns riſing before 6 a clock, if in the Southern then after 6 a clock.

Again.

16. Having the time of the Suns riſing, before or after 6 a clock, you may get the length of the Artificiall day (that is, the time of the Sunns continuance above the horizon) If the Suns declination be North add it to 6, if South ſubtract it from 6, and ſo ſhall come forth the ſemidiurnall arch, this doubled giveth the length of the artificiall day; But if the length of the artificiall night be required, then work contrary to that of the day.

To find the time of the day by having the Altitude of the Sunn.

17. First by a Quadrant or some other instrument find the Altitude of the Sunn above the horizon, and then by the 6, 7, and 8, prop. rectify the Globe for the Latitude, the Suns place, and the Zenith, and bring the degree of the Ecliptick wherein the Sunn is, to agree to the same Altitude upon the edge of the quadrant of altitude, and then the index of the howre wheele, shall shew the time of the day.

To find the Azimuth of the Sunn by having his Altitude.

18. The Azimuth of the Sunn, is the distance thereof, accounted in the Horizon from East West, north or South; by the 6,7, & 8, prop. rectify the Globe, and bring the Sunns place in the Ecliptick, to agree to the same Altitude on the graduated edge of the Quadrant of Altitude, and then the quadrant of Altitude shall shew his azimuth in the horizon.

To find the Azimuth of the Sun at any time of the Day.

19, By the 6, 7 and 8 prop. rectify the Globe, and turne it about till the index of the howre-wheele, do point to the howre given, then lay the quadrant of altitude upon the Suns place in the Ecliptick, and it sheweth the Azimuth in the Horizon.

At any time of the year, to find the time of Day break, or beginning of Crepusculū (if any be.)

20. By the 6,7,& 8 prop. rectifie the globe and elevate the opposite degree of the Sun at the West 18 degrees above the horizon, and then the index of the howre wheel shall shew the time.

Having the altitude of any known Starr, to find the howre of the night.

21. By the 6,7,& 8 prop. rectifie the globe and move about the Globe till the starr have the given altitude in the graduated edge of the quadrant of altitude, & then shall the index of the howre wheele shew the howre required.

Having any known Starr at the Meridian to find the howre.

22. By the 6, & 7 prop. rectifie the globe and turn the globe till the same starr come to the brasen meridian, so shall the index of the howre wheel shew the howre.

Of the Poeticall rising and setting of Starrs.

COSMICALL.

A Starr riseth Cosmicall when it riseth with the Sunn, and setteth Cosmicall, if it sett when the Sunn riseth.

To find the time of the yeare when a Starr riseth Cosmicall

23. By the 6 prop: rectify, and bring the starr to the East part of the Horizon, and observe the degree of the Ecliptick which is at the

the eaſt part of the horizon with it, and then find in the circle of the horizon what day of the month anſwereth to the ſame degree of the Ecliptick.

To find the time of the year when a Starr ſetteth Coſmicall.

24. By the 6 prop. rectifie and bring the ſtarr to the Weſt part of the horizon, and note the degree of the Ecliptick at the eaſt part of the horizon, and find the day of the month on the horizon as before.

ACRONICALL.

A Starr riſeth Acronicall, when it riſeth in the Eaſt, and the Sunn is ſetting in the Weſt; And it ſetteth Acronicall when it ſetteth with the Sunn.

To find the time of the year when a Starr riſeth Acronicall.

25. By the 6 prop. rectifie, and bring the ſtarr to the eaſt part of the horizon, and note the degree of the Ecliptick cut by the horizon at the Weſt, and find the day of the month anſwering thereunto upon the horizon as before.

To find the time of the year when a Starr ſetteth Acronicall.

26. By the ſixt prop. rectifie and bring the Starr to the Weſt part of the horizon, and note the degree of the Ecliptick cutt at the Weſt of the horizon and find the day

day of the Month upon the Horizon as before.

Heliacall.

Heliacall rising of a starr is the rising of a starr out of the Sun beams, for then it appeareth before the Sun rising, though before it could not be seen by reason of its neernes to the Sun being within the Arch of vision.

Heliacall setting is when a starr cometh within the Sun beams, or when a starr is entring into its arch of vision, and then cannot be seen setting after the Sunn, by reason of its neernes to the Sun.

The Arch of vision is the Arch of a verticall circle contained between the Horizon and the center of the Sun after it is sett, or before it riseth, this altereth according to the severall magnitudes of the starrs, for the greater the starr is, the lesse is the Arch of vision, and contrarie.

The Arches of Vision belonging to the Stars, according to their severall magnitudes are these.

To the First	12	*To the Planets.*	
Second	13	Venus	5
Third	14	Mercurie	10
Fourth	15	Saturne	11
Fift	16	Jupiter	9
Sixt	17	Mars	$12\frac{1}{2}$
Least	18	Moone uncertain.	

To

To find the time of the year when a ſtarr riſeth Heliacall.

27. By the ſixt Prop. rectifie, and bring the ſtarr to the eaſt part of the horizon, and note the degree of the Ecliptick elevated above the weſt part of the horizon according to the arch of viſion appertaining to the ſame ſtarr, and then as before, find the day of the month on the limb of the Horizon, anſwering to the oppoſite degree of the Ecliptick ſo elevated at the weſt as aforeſaid.

To find the time of the year when a Starr ſetteth Heliacall.

28. By the ſixt prop. rectify and bring the ſtarr to the weſt part of the Horizon, and note the degree of the Ecliptick elevated at the eaſt part of the horizon, according to the arch of viſion belonging to the ſame ſtar, & by the oppoſite of it find the day of the month on the limb of the horizon as before.

Deſcription of the Terreſtiall GLOBE.

IT is a round or ſphericall body, repreſenting the forme of the earth and waters.

On this Globe are alſo deſcribed the ten circles of the *ſpæra armillaris*, *viz.* the *Horizon*, *Meridian*, *Equator*, *Ecliptick*, the two Colures

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with the fower leſſer circles, *viz.* the two Tropicks, and the two polar circles.

Beſides theſe common circles there are deſcribed upon this Globe divers other circles paſſing through both poles of the World, theſe are called Meridians, or circles of Longitude; Alſo certain other circles parallel to the Equinoctiall, called circles or parallels of Latitude; Alſo certain oblique circular lines paſſing through the centers of certain roſes (ſo called) and theſe are called Rhombs, Courſes, or points of the compaſſe.

On this Globe are deſcribed the known parts of the World divided into ſeverall quarters, *Europe*, *Aſia*, *Africa*, and *America*, to which is added the unknown land about the South Pole called *Megalanica*. And theſe quarters of the World are ſubdivided into ſeverall Kingdoms and Provinces, as may be ſeen in the *Geographers*.

The ZONES.

This Globe is alſo divided into five Zones, one is called the Torrid or burnt Zone, and this lyeth between the Tropicks, the inhabitants hereof are called *Amphiſcii*, becauſe they have two contrary meridionall ſhadows in a year.

Two are called temperate, and theſe lye between the Tropicks and the Polar circles; The inhabitants hereof are called *Heteroſcii*, becauſe they have their Meridionall ſhadow

one

one way all the yeare.

The two frigid Zones, are comprehended within the polar circles; The inhabitants whereof are called *Periſcii* becauſe their ſhadow at ſome time of the yeare goeth round about them.

The Inhabitants of the Terreſtiall Globe, do alſo receive other names relating to their poſitions each to other.

The *Antipodes* are ſuch as dwell diametrically oppoſite each to other, & have all things contrary, as ſeaſons of the yeare, and times of the day.

The *Antœci* are ſuch as dwell ſo far remote from the Equinoctiall on one ſide, as the other dwelleth on the other ſide, both under the ſame Meridian.

Theſe have ſome things common, and ſome things proper, the common, as to have their noon tides together: Proper as that the winter of the one, is the others Summer time, and the longeſt day of the one, is the ſhorteſt of the other.

The *Periœci* are ſuch as live in the ſame parallel of Latitude toward the ſame Pole, and are directly oppoſite each to other, both having the ſame meridian, Theſe have their Summers, Winters, and increaſe, and ſhortning of dayes and nights together, but the night of the one is the day of the other.

Parallels

Parallels of the Longest day.

Besides the parallels of Latitude formerly mentioned, there are other parallels immagined to be drawn upon this Globe, which are called parallels of the longest day: The first of them is to be drawn at that distance from the Equinoctiall, where the longest day of the year is $12\frac{1}{4}$ howres long: The second where the longest day of the yeare is $12\frac{1}{2}$ howres long: The third where the longest day of the year is $12\frac{3}{4}$ howres long, &c. through places increasing their longest day by $\frac{1}{4}$ of an howre, till you come to the parallel where the longest day of the yeare is 24 howres long, which is under the polar cyrcles; these being drawn each way from the Equinoctiall toward each pole, divide the Globe into unequall parts or spaces, for though they be equall in time, yet they agree not in equall distance of place, but are greater or broader neer to the Equinoctiall, and are narrower the farther they are from it.

CLIMATS.

A Climate containeth two of the parallels of the longest day, and altereth the longest day by the space of half an howre, beginning at the Equinoctiall, and are in all 24, which end under the polar circle; but the antients, for want of knowledge of the parts under the Equinoctiall made at first but seaven Climats, and called them by names, & afterwards were added two more

more, which made up their number to be nine. And these of the antients began to be accounted at 12 and 15′ from the Equator.

Propositions on the Terrestiall GLOBE.

To find the Latitude of any place sett thereon.

Bring the place to the brazen meridian, and therein account how many degrees are betwixt the Equinoctiall and the place, for that is the Latitude you seek; for the Latitude is but the remotion of the Zenith of a place frō the equator.

To find the Longitude of a place set tthereon.

Bring the place under the brasen meridian, and then the meridian shall cut the Equinoctiall in the Longitude of the same place; for the Longitude is but the remotion of a place from the first meridian which passeth through the Azores accounting Eastwardly.

To find the distance between two places.

Put the center of the quadrant of altitude upon one of the places, and the graduated edge upon the other, & the degrees interjacent shall shew their distance in degrees, and these may be turned into miles by multiplying by 60.

To find how one place beareth or lyeth frō another.

Elevate the pole according to the Latitude of the place where you are, & fasten the quadrant of altitude at the Zenith, then bring the place where you are to the zenith, and move the graduated edge of the quadrant of altitude to the other place, and then the end of the quadrant of altitude shall fall upon the horizon in the point of bearing.

To find what howre of the day or night it is at any place on the Terrestiall Globe

Bring the place where you are to the meridian, and turne the index of the howre wheel to the howre it is with you at the present, then turne the other place to the brasen meridian, and the index of the howre wheele will shew the howre desired.

To find by the Terrestiall Globe the quantity of the longest day at any place assigned.

Elevate the pole of the Globe according to the latitude of the place given, and bring the Solstitiall point of cancer (if the north pole be elevated) to the meridian, & turn the index of the howre wheel to 12 at noon, then if you put the Solstitiall point of Cancer to the west part of the horizon, the index on the howre wheel sheweth the time of Sun setting there, & that is also the semidiurnall arch, & being doubled giveth the length of the day, if it exceed not 24 howres, which end under the polar circle.

But if the place assigned be within the polar cyrcle, then elevate the pole af the globe according to the latitude of the place, & turn the globe till some point of the vernall signes in the Ecliptick touch the north point of the horizon & note how many degrees of the Ecliptick is from the Solstitiall point of Cancer, for that number doubled giveth neerly the length of the day in our common days, and these days may be turned into weeks or months, &c.

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